

**AMENDMENTS TO THE CLAIMS**

1 1. (Currently Amended) A method, comprising the computer-implemented steps of:  
2 receiving trust information defining one or more trusted signatories;  
3 receiving, in association with a particular configuration directive, security  
4 information defining a number of required signatures and required principals;  
5 receiving configuration information comprising a hostname, one or more  
6 configuration directives for a host network element associated with the  
7 hostname, and ~~one~~ two or more digital signatures of the hostname and  
8 configuration directives;  
9 wherein the configuration information includes the particular configuration directive;  
10 attempting to verify the ~~one~~ two or more digital signatures based on the trust  
11 information and the security information;  
12 verifying that the two or more digital signatures, ~~from the one or more digital~~  
13 ~~signatures,~~ are valid and that two or more principals respectively associated  
14 with the two or more digital signatures have collective authority to perform  
15 the configuration directives on the host network element;  
16 applying the configuration directives to the host network element only when the ~~one~~  
17 two or more digital signatures are verified successfully;  
18 wherein applying the configuration directives comprises applying the particular  
19 configuration directive only when the configuration information has the  
20 number of required signatures by the required principals.

1 2. (Canceled)

1 3. (Canceled)

1 4. (Currently Amended) A method as recited in Claim 1, ~~further comprising the steps~~  
2 ~~of:~~  
3 ~~receiving, in association with a particular configuration directive, security~~  
4 ~~information defining a number of required signatures and required principals;~~

5        wherein applying the particular configuration directive comprises applying the  
6                particular configuration directive only when the configuration information has  
7                the number of required signatures by the required principals and only upon  
8                successively validating all required signatures.

1    5.    (Currently Amended) A method as recited in Claim 1, wherein the two or more  
2                digital signatures use public key cryptography, and wherein public keys for the two or  
3                more digital signatures are stored on the host.

1    6.    (Currently Amended) A method as recited in Claim 1, wherein the two or more  
2                digital signatures use public key cryptography, wherein public keys for the two or  
3                more digital signatures are stored on a key server and retrieved from the key server as  
4                part of attempting to validate the two or more digital signatures.

1    7.    (Currently Amended) A method as recited in Claim 1, wherein the two or more  
2                digital signatures use public key cryptography, and wherein public keys for the two or  
3                more digital signatures are received in a digital certificate and extracted from the  
4                digital certificate as part of attempting to validate the two or more digital signatures.

1    8.    (Original)    A method, comprising the computer-implemented steps of:  
2                receiving trust information defining one or more trusted signatories;  
3                receiving configuration control information that includes a time period during which  
4                        a valid digital signature is required for applying one or more particular  
5                        configuration directives;  
6                receiving configuration information comprising a hostname, one or more  
7                        configuration directives for a host network element associated with the  
8                        hostname, one or more digital signatures of the hostname and configuration  
9                        directives, and a date-time value;  
10                determining if the date-time value is within the time period;  
11                determining if the one or more configuration directives have been previously received  
12                during the time period; and

13 only when the date-time value is within the time period and the one or more  
14 configuration directives have not been previously received during the time  
15 period, attempting to verify the one or more digital signatures based on the  
16 trust information, and applying the configuration directives to a network  
17 element only when the one or more digital signatures are verified successfully.

1 9. (Original) A method as recited in Claim 8, wherein the step of determining if the  
2 one or more configuration directives have been previously received during the time  
3 period comprises the steps of:  
4 generating a secure hash of the one or more configuration directives;  
5 determining if the secure hash is found in memory.

1 10. (Original) A method as recited in Claim 8, wherein the step of determining if the  
2 one or more configuration directives have been previously received during the time  
3 period comprises the steps of:  
4 generating a secure hash of the one or more configuration directives;  
5 determining if the secure hash is found in non-volatile memory.

1 11. (Original) A method as recited in Claim 8, further comprising the step of storing  
2 the secure hash in non-volatile memory, in association with an expiration value, when  
3 the date-time value is within the time period and the one or more configuration  
4 directives have not been previously received during the time period.

1 12. (Original) A method as recited in Claim 8, further comprising the steps of:  
2 verifying that the one or more digital signatures is valid and that one or more  
3 principals respectively associated with the digital signatures have collective  
4 authority to perform the directives on the host.

1 13. (Original) A method as recited in Claim 8, further comprising the steps of:  
2 receiving, in association with a particular configuration directive, security  
3 information defining a number of required signatures and required principals;

4 applying the particular configuration directive only when the configuration  
5 information has the number of required signatures by the required principals.

1 14. (Original) A method as recited in Claim 8, further comprising the steps of:  
2 receiving, in association with a particular configuration directive, security  
3 information defining a number of required signatures and required principals;  
4 applying the particular configuration directive only when the configuration  
5 information has the number of required signatures by the required principals  
6 and only upon successively validating all required signatures.

1 15. (Original) A method as recited in Claim 8, wherein the digital signatures use  
2 public key cryptography, and wherein public keys for the digital signatures are stored  
3 on the host.

1 16. (Original) A method as recited in Claim 8, wherein the digital signatures use  
2 public key cryptography, wherein public keys for the digital signatures are stored on a  
3 key server and retrieved from the key server as part of attempting to validate the  
4 digital signatures.

1 17. (Original) A method as recited in Claim 8, wherein the digital signatures use  
2 public key cryptography, and wherein public keys for the digital signatures received  
3 in a digital certificate and extracted from the digital certificate as part of attempting to  
4 validate the digital signatures.

1 18. (Original) A method for verifying configuration changes for network devices  
2 using digital signatures, comprising the computer-implemented steps of:  
3 receiving a public key for a user of the network devices;  
4 receiving configuration control information that includes a time period during which  
5 a valid digital signature is required for applying one or more particular  
6 configuration directives to a specified network device;  
7 receiving configuration information comprising a hostname, one or more  
8 configuration directives for the specified network device associated with the

hostname, one or more digital signatures of the hostname and configuration directives, and a date-time value;  
determining if the date-time value is within the time period;  
determining if the one or more configuration directives have been previously received during the time period, by generating a secure hash of the one or more configuration directives and determining if the secure hash is found in memory; and  
only when the date-time value is within the time period and the one or more configuration directives have not been previously received during the time period, performing the steps of:  
attempting to verify the one or more digital signatures based on generating a secure hash of the one or more configuration directives using the public key and comparing the secure hash to the one or more digital signatures,  
and applying the configuration directives to a network element only when the one or more digital signatures are verified successfully.

19. (Original) A method as recited in any of Claims 1, 8, or 18, wherein the one or more digital signatures comprise a first digital signature of the one or more configuration directives by a first user, and a second digital signature by a second user, wherein the second digital signature is applied to a resultant of the first digital signature.

20. (Original) A method as recited in any of Claims 1, 8, or 18, wherein the one or more digital signatures comprise a first digital signature of a first portion of the one or more configuration directives by a first user, a second digital signature of a second portion of the one or more configuration directives by a second user, and a third digital signature by a third user, wherein the third digital signature is applied to a resultant of the first digital signature and the second digital signature.

21. (Currently Amended) A computer-readable volatile or non-volatile medium ~~carrying~~ storing one or more sequences of instructions for verifying configuration

changes for network devices using digital signatures, which instructions, when executed by one or more processors, cause the one or more processors to carry out the steps of:

receiving trust information defining one or more trusted signatories;  
receiving, in association with a particular configuration directive, security information defining a number of required signatures and required principals;

receiving configuration information comprising a hostname, one or more configuration directives for a host network element associated with the hostname, and ~~one~~ two or more digital signatures of the hostname and configuration directives;

wherein the configuration information includes the particular configuration directive;

attempting to verify the ~~one~~ two or more digital signatures based on the trust information and the security information;

verifying that the two or more digital signatures, ~~from the one or more digital signatures,~~ are valid and that two or more principals respectively associated with the two or more digital signatures have collective authority to perform the configuration directives on the host network element;

applying the configuration directives to the host network element only when the ~~one~~ two or more digital signatures are verified successfully;

wherein applying the configuration directives comprises applying the particular configuration directive only when the configuration information has the number of required signatures by the required principals.

22. (Canceled)

23. (Currently Amended) A computer-readable volatile or non-volatile medium as recited in Claim 21, wherein the ~~one~~ two or more digital signatures comprise a first digital signature of the one or more configuration directives by a first user, and a second digital signature by a second user, wherein the second digital signature is applied to a resultant of the first digital signature.

1 24. (Currently Amended) A computer-readable volatile or non-volatile medium as recited  
2 in Claim 21, wherein the ~~one~~ two or more digital signatures comprise a first digital  
3 signature of a first portion of the one or more configuration directives by a first user,  
4 a second digital signature of a second portion of the one or more configuration  
5 directives by a second user, and a third digital signature by a third user, wherein the  
6 third digital signature is applied to a resultant of the first digital signature and the  
7 second digital signature.

1 25. (Currently Amended) An apparatus for verifying configuration changes for network  
2 devices using digital signatures, comprising:  
3 means for receiving trust information defining one or more trusted signatories;  
4 means for receiving, in association with a particular configuration directive, security  
5 information defining a number of required signatures and required principals;  
6 means for receiving configuration information comprising a hostname, one or more  
7 configuration directives for a host network element associated with the  
8 hostname, and ~~one~~ two or more digital signatures of the hostname and  
9 configuration directives;  
10 wherein the configuration information includes the particular configuration directive;  
11 means for attempting to verify the ~~one~~ two or more digital signatures based on the  
12 trust information and the security information;  
13 means for verifying that the two or more digital signatures, ~~from the one or more~~  
14 ~~digital signatures,~~ are valid and that two or more principals respectively  
15 associated with the two or more digital signatures have collective authority to  
16 perform the configuration directives on the host network element;  
17 means for applying the configuration directives to the host network element only  
18 when the ~~one~~ two or more digital signatures are verified successfully;  
19 wherein the means for applying the configuration directives comprise means for  
20 applying the particular configuration directive only when the configuration  
21 information has the number of required signatures by the required principals.

1 26. (Canceled)

1 27. (Currently Amended) An apparatus as recited in Claim 25, wherein the ~~one~~ two or  
2 more digital signatures comprise a first digital signature of the one or more  
3 configuration directives by a first user, and a second digital signature by a second  
4 user, wherein the second digital signature is applied to a resultant of the first digital  
5 signature.

1 28. (Currently Amended) An apparatus as recited in Claim 25, wherein the ~~one~~ two or  
2 more digital signatures comprise a first digital signature of a first portion of the one or  
3 more configuration directives by a first user, a second digital signature of a second  
4 portion of the one or more configuration directives by a second user, and a third  
5 digital signature by a third user, wherein the third digital signature is applied to a  
6 resultant of the first digital signature and the second digital signature.

1 29. (Currently Amended) An apparatus for verifying configuration changes for network  
2 devices using digital signatures, comprising:  
3 a network interface that is coupled to the data network for receiving one or more  
4 packet flows therefrom;  
5 a processor;  
6 one or more stored sequences of instructions which, when executed by the processor,  
7 cause the processor to carry out the steps of:  
8 receiving trust information defining one or more trusted signatories;  
9 receiving, in association with a particular configuration directive, security  
10 information defining a number of required signatures and required  
11 principals;  
12 receiving configuration information comprising a hostname, one or more  
13 configuration directives for a host network element associated with the  
14 hostname, and ~~one~~ two or more digital signatures of the hostname and  
15 configuration directives;  
16 wherein the configuration information includes the particular configuration  
17 directive;



attempting to verify the ~~one~~ two or more digital signatures based on the trust information and the security information;  
verifying that ~~the~~ two or more digital signatures, ~~from the one or more digital signatures~~, are valid and that two or more principals respectively associated with the two or more digital signatures have collective authority to perform the configuration directives on the host network element;  
applying the configuration directives to the host network element only when the ~~one~~ two or more digital signatures are verified successfully;  
wherein applying the configuration directives comprises applying the particular configuration directive only when the configuration information has the number of required signatures by the required principals.

1 30. (Canceled)

1 31. (Currently Amended) An apparatus as recited in Claim 29, wherein the ~~one~~ two or  
2 more digital signatures comprise a first digital signature of the one or more  
3 configuration directives by a first user, and a second digital signature by a second  
4 user, wherein the second digital signature is applied to a resultant of the first digital  
5 signature.

1 32. (Currently Amended) An apparatus as recited in Claim 29, wherein the ~~one~~ two or  
2 more digital signatures comprise a first digital signature of a first portion of the one or  
3 more configuration directives by a first user, a second digital signature of a second  
4 portion of the one or more configuration directives by a second user, and a third  
5 digital signature by a third user, wherein the third digital signature is applied to a  
6 resultant of the first digital signature and the second digital signature.

1 33. (Canceled)

1 34. (Currently Amended) A computer-readable volatile or non-volatile medium as recited  
2 in Claim 21, ~~further comprising instructions which, when executed by the one or~~  
3 ~~more processors, cause the one or more processors to perform the steps of:~~  
4 ~~receiving, in association with a particular configuration directive, security~~  
5 ~~information defining a number of required signatures and required principals;~~  
6 wherein the instructions that cause the one or more processors to perform the step of  
7 applying the particular configuration directive comprise instructions which,  
8 when executed by the one or more processors, cause the one or more  
9 processors to perform the step of applying the particular configuration  
10 directive only when the configuration information has the number of required  
11 signatures by the required principals and only upon successively validating all  
12 required signatures.

1 35. (Currently Amended) A computer-readable volatile or non-volatile medium as recited  
2 in Claim 21, wherein the two or more digital signatures use public key cryptography,  
3 and wherein public keys for the two or more digital signatures are stored on the host  
4 network element.

1 36. (Currently Amended) A computer-readable volatile or non-volatile medium as recited  
2 in Claim 21, wherein the two or more digital signatures use public key cryptography,  
3 wherein public keys for the digital signatures are stored on a key server and retrieved  
4 from the key server as part of attempting to validate the two or more digital  
5 signatures.

1 37. (Currently Amended) A computer-readable volatile or non-volatile medium as recited  
2 in Claim 21, wherein the two or more digital signatures use public key cryptography,  
3 and wherein public keys for the two or more digital signatures are received in a  
4 digital certificate and extracted from the digital certificate as part of attempting to  
5 validate the two or more digital signatures.

1 38. (Canceled)

- 1 39. (Currently Amended) An apparatus as recited in Claim 25, ~~further comprising:~~  
2 ~~means for receiving, in association with a particular configuration directive, security~~  
3 ~~information defining a number of required signatures and required principals;~~  
4 wherein the means for applying the particular configuration directive comprise means  
5 for applying the particular configuration directive only when the configuration  
6 information has the number of required signatures by the required principals  
7 and only upon successively validating all required signatures.
- 1 40. (Currently Amended) An apparatus as recited in Claim 25, wherein the two or more  
2 digital signatures use public key cryptography, and wherein public keys for the two or  
3 more digital signatures are stored on the host network element.
- 1 41. (Currently Amended) An apparatus as recited in Claim 25, wherein the two or more  
2 digital signatures use public key cryptography, wherein public keys for the two or  
3 more digital signatures are stored on a key server and retrieved from the key server as  
4 part of attempting to validate the two or more digital signatures.
- 1 42. (Currently Amended) An apparatus as recited in Claim 25, wherein the two or more  
2 digital signatures use public key cryptography, and wherein public keys for the two or  
3 more digital signatures are received in a digital certificate and extracted from the  
4 digital certificate as part of attempting to validate the two or more digital signatures.
- 1 43. (Canceled)
- 1 44. (Currently Amended) An apparatus as recited in Claim 29, ~~further comprising~~  
2 ~~instructions which, when executed by the one or more processors, cause the one or~~  
3 ~~more processors to perform the steps of:~~  
4 ~~receiving, in association with a particular configuration directive, security~~  
5 ~~information defining a number of required signatures and required principals;~~  
6 wherein the instructions that cause the processor to perform the step of applying the  
7 particular configuration directive comprise instructions which, when executed

8           by the one or more processors, cause the processor to perform the step of  
9           applying the particular configuration directive only when the configuration  
10          information has the number of required signatures by the required principals  
11          and only upon successively validating all required signatures.

1   45.   (Currently Amended) An apparatus as recited in Claim 29, wherein the two or more  
2          digital signatures use public key cryptography, and wherein public keys for the two or  
3          more digital signatures are stored on the host network element.

1   46.   (Currently Amended) An apparatus as recited in Claim 29, wherein the two or more  
2          digital signatures use public key cryptography, wherein public keys for the two or  
3          more digital signatures are stored on a key server and retrieved from the key server as  
4          part of attempting to validate the two or more digital signatures.

1   47.   (Currently Amended) An apparatus as recited in Claim 29, wherein the two or more  
2          digital signatures use public key cryptography, and wherein public keys for the two or  
3          more digital signatures are received in a digital certificate and extracted from the  
4          digital certificate as part of attempting to validate the two or more digital signatures.